

PATENT APPLICATION

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q86052

Takashi TAKEDA, et al.

Appln. No.: 10/525,014

Group Art Unit: 1755

Confirmation No.: 5022

Examiner: Carol M. KOSLOW

Filed: February 17, 2005

For: PHOSPHOR AND VACUUM ULTRAVIOLET RADIATION EXCITED LIGHT-
EMITTING DEVICE

SUBMISSION OF APPEAL BRIEF

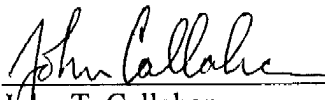
MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. The statutory fee of \$ 510.00 is being charged to Deposit Account No. 19-4880 via EFS Payment Screen. The USPTO is also directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Respectfully submitted,

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Date: February 8, 2008

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellants submit the following:

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I. REAL PARTY IN INTEREST

The real party in interest is Sumitomo Chemical Company, Ltd. by virtue of the Assignment submitted and recorded in the present application.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representatives, and the Assignee of this application are not aware of any other appeals or interferences that will directly affect, be affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 3-6 are pending.

Claims 3, 4 and 6 are allowed.

This is an appeal from the following rejection:

- Claim 5 is rejected under 35 U.S.C. § 102 (b) as allegedly being anticipated by EP 21,536.

A copy of pending Claims 3-6 is set forth in the attached Claims Appendix.

IV. STATUS OF AMENDMENTS

An Amendment under 37 C.F.R. § 1.116 was filed September 21, 2007. The Advisory Action mailed October 1, 2007, indicates that for purposes of appeal, the proposed amendments will be entered. Thus, it is Appellants' understanding that the Amendment filed September 21, 2007, has been entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention relates to a phosphor and a vacuum ultraviolet radiation excited light-emitting device comprising the phosphor.

An object of the present invention is to provide a phosphor having high luminescence, suitable for use in a vacuum ultraviolet radiation excited light-emitting device. *See*, p. 2, lines 1-3 of the present specification.

The vacuum ultraviolet radiation excited light-emitting device comprises a phosphor, a plate and an electrode. More practically, the vacuum ultraviolet radiation excited light-emitting device comprises a rear plate, an address electrode, a barrier rib, a protective layer, a dielectric layer, a transparent electrode, a bus electrode, and a glass front plate. *See*, page 9, lines 10-17 of the present specification.

The phosphor to be used in the vacuum ultraviolet radiation excited light-emitting device is prepared by mixing it with a binder comprising a cellulose compound, a polymer such as polyvinyl alcohol, and an organic solvent to prepare a phosphor paste. The inner surface of the rear plate, provided with address electrodes formed in a stripe shape by the barrier ribs, is coated with the resulting paste by screen printing or other similar methods. This is followed by calcining at from 300°C to 600°C to form the respective phosphor layers. *See*, p. 9, line 19 to p. 10, line 6 of the present specification.

The surface glass plate, provided with a dielectric layer and a protective layer, is then superimposed on the inner surface of the rear plate so that transparent electrodes and bus electrodes are arranged in the direction perpendicular to the phosphor layers, and then bonded to the rear plate. Finally, the inside is evacuated and a rare gas of low pressure such as Xe or Ne is

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sealed within to create discharge spaces, and form a vacuum ultraviolet radiation excited light-emitting device. *See*, p. 10, lines 6-13 of the present specification.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Appellants seek review of the rejection of Claim 5 under 35 U.S.C. § 102 (b) as allegedly being anticipated by EP 21,536.

The Examiner cites EP 21,536 for its teaching of silicate phosphors and their use in low pressure mercury lamps. The Examiner alleges that low pressure mercury lamps are vacuum ultraviolet radiation excited light-emitting devices. *See*, the Advisory Action dated October 1, 2007 and the Office Action dated May 21, 2007.

VII. ARGUMENT

Appellants respectfully submit that Claim 5 is not anticipated by EP 21,536.

Claim 5 of the present invention recites:

A vacuum ultraviolet radiation excited light-emitting device comprising a phosphor represented by formula $(M^{1}_{1-e}Ln^2_e)(M^{2}_{1-f}Ln^1_f)_2M^3_6O_{18}$ wherein M^1 is at least one metal element selected from the group consisting of Ca, Sr, and Ba, M^2 is at least one metal element selected from the group consisting of Y, La, Gd, and Lu, M^3 is at least one metal element selected from the group consisting of Si and Ge and oxygen, Ln^1 is at least one metal element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Tb, Dy, Ho, Er, Tm, Yb, and Mn, Ln^2 is at least one element selected from the group consisting of Sm, Eu, Yb, and Mn, e is from 0 to 0.5, f is from 0 to 0.5, and the sum of e and f is not less than 0.

To support an “anticipation” rejection under 35 U.S.C. § 102, the reference must disclose every element and limitation of an Applicant’s claims. Rejections under 35 U.S.C. § 102 are proper only when the claimed subject matter is identically disclosed or described in a single prior art reference. Thus the reference must clearly and unequivocally disclose every element and limitation of the claimed invention.

A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently in a single prior art reference.¹ In fact, the identical invention must be shown in as complete detail as contained in the claim.²

¹ See *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

² See *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

In the final Office Action dated May 21, 2007, the Examiner alleges that Claim 5 reads on EP 21,536. Specifically, the Examiner cites EP 21,536 for teaching silicate phosphors and their use in low-pressure mercury vapor lamps. EP 21,536 makes no mention of a vacuum ultraviolet radiation exciting device. However, the Examiner alleges that the low-pressure mercury vapor lamp taught in EP 21,536 is a vacuum ultraviolet radiation exciting device, without support. *See*, page 2 of the Final Office Action dated May 21, 2007.

Appellants respectfully submit that EP 21,536 fails to disclose all of the features recited in Claim 5 because EP 21,536 fails to disclose a vacuum ultraviolet radiation excited light-emitting device.

EP 21,536 discloses a low pressure mercury vapor discharge lamp which emits light having a wavelength of approximately 254 nm. *See*, page 3, lines 14-16 of the EP 21,536 specification. The low-pressure mercury vapor discharge lamp is not a vacuum ultraviolet radiation exciting device, since it is well known in the art that the light in such lamps has a wavelength of 254 nm. This is outside the range recognized in the art as being the vacuum ultraviolet region.

Appellants submit herewith an excerpt from the Phosphor Handbook, demonstrating that the wavelength region between about 0.2 and 200 nm is called the vacuum-ultraviolet region. *See*, Phosphor Handbook, chapter 14.6, page 727, line 1. For instance, Appellants employ a lamp that has a wavelength of 146 nm, within the range of 0.2 and 200 nm, in the working Examples of the present application. This reference was considered by the Examiner as part of the Appellants' Request for Reconsideration filed on January 18, 2008.

Appellants further respectfully note that when an electric current is passed through mercury vapor, only ultraviolet radiation with a wavelength of about 254 nm is produced. *See*, page 7 of EP 21,536, line 5. Accordingly, a person of ordinary skill in the art would understand that low-pressure vapor lamps are not vacuum ultraviolet radiation exciting devices.

In the Advisory Action dated October 10, 2007, the Examiner references U.S. patent Application Publication No. 2002/0,023,670 to Shiramizu et al. (“Shiramizu”) and U.S. Patent Application Publication No. 2007/0,072,093 to Sawada et al. (“Sawada”) to support her position that low pressure mercury lamps are vacuum ultraviolet radiation exciting devices, and to rebut Appellants’ arguments to the contrary. *See*, page 2 of the Advisory Action dated October 10, 2007, page 2.

It is well known that an Applicant is entitled to be his or her own lexicographer and may rebut the presumption that terms are to be given their ordinary and customary meaning by clearly setting forth a definition of the term that is different from its ordinary and customary meaning.³ That appears to be what Shiramizu and Sawada have done here.

Appellants respectfully submit that the present inventors use the term “vacuum ultraviolet light” for its common meaning, a light with a wavelength of about 0.2 to 200 nm, in the specification and claims. Shiramizu and Sawada, however, do not. In Shiramizu, for example, the term “vacuum ultraviolet light” is used to refer to a light with a wavelength of 254 nm. Specifically, Shiramizu refers to a method of removing organic matters deposited on the surface of a semiconductor comprising “irradiating the surface with vacuum ultraviolet light

³ *See In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994)

(wavelength: 254 nm) in an ozone atmosphere.” *See*, paragraph [0008]. This wavelength is outside the range of vacuum ultraviolet light, as commonly defined in the art. Further, in Sawada, the expression “vacuum ultraviolet light” is used in reference to light with a wavelength of 100-250 nm, and preferably set into the range of 150-200 nm. Sawada states:

The wavelength of the vacuum-ultraviolet light is usually set into the range of 100 nm to 250 nm. The wavelength of the vacuum-ultraviolet light used in the invention is preferably set into the range of 150 nm to 200 nm. *See*, paragraph [0055];

and,

A light source for the vacuum-ultraviolet light may be selected from an excimer lamp, a low-pressure mercury lamp, and other various light sources. *See*, paragraph [0056].

Appellants respectfully submit that Sawada’s definition of the vacuum ultraviolet region does not include 254 nm. While Sawada mentions low-pressure mercury lamps, 254 nm is outside Sawada’s broad range of 100-250 nm. Appellants further submit that the Phosphor Handbook, a standard reference in the field, is more authoritative on the meaning of the vacuum ultraviolet region than the Shiramizu and Sawada patent application publications.

Accordingly, Appellants respectfully request the reversal of this § 102 rejection.

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

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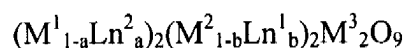
CLAIMS APPENDIX

CLAIM ON APPEAL:

1. (canceled).

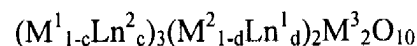
2. (canceled).

3. (previously amended): A phosphor represented by formula



wherein M^1 is at least one metal element selected from the group consisting of Ca, Sr, and Ba, M^2 is at least one metal element selected from the group consisting of Y, La, Gd, and Lu, M^3 is at least one metal element selected from the group consisting of Si and Ge and oxygen, Ln^1 is at least one metal element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Tb, Dy, Ho, Er, Tm, Yb, and Mn, Ln^2 is at least one element selected from the group consisting of Sm, Eu, Yb, and Mn, a is from 0 to 0.5, b is from 0 to 0.5, and the sum of a and b is not less than 0.

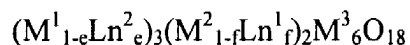
4. (previously amended): A phosphor represented by formula



wherein M^1 is at least one metal element selected from the group consisting of Ca, Sr, and Ba, M^2 is at least one metal element selected from the group consisting of Y, La, Gd, and Lu, M^3 is at least one metal element selected from the group consisting of Si and Ge and oxygen, Ln^1 is at least one metal element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Tb, Dy,

Ho, Er, Tm, Yb, and Mn, Ln^2 is at least one element selected from the group consisting of Sm, Eu, Yb and Mn, c is from 0 to 0.5, d is from 0 to 0.5 and the sum of c and d is not less than 0.

5. (previously amended): A vacuum ultraviolet radiation excited light-emitting device comprising a phosphor represented by formula



wherein M^1 is at least one metal element selected from the group consisting of Ca, Sr, and Ba, M^2 is at least one metal element selected from the group consisting of Y, La, Gd, and Lu, M^3 is at least one metal element selected from the group consisting of Si and Ge and oxygen, Ln^1 is at least one metal element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Tb, Dy, Ho, Er, Tm, Yb, and Mn, Ln^2 is at least one element selected from the group consisting of Sm, Eu, Yb, and Mn, e is from 0 to 0.5, f is from 0 to 0.5, and the sum of e and f is not less than 0.

6. (previously amended): A vacuum ultraviolet radiation excited light-emitting device comprising the phosphor according to claim 3 or 4.

EVIDENCE APPENDIX:

- Phosphor Handbook, chapter 14.6, page 727. This reference was considered and entered in the record by the Examiner with the Request for Reconsideration, filed on January 18, 2008.

RELATED PROCEEDINGS APPENDIX

As mentioned in Section II, Appellants, Appellants' legal representatives, and the Assignee of this application are not aware of any other appeals or interferences that will directly affect, be affected by, or have a bearing on the Board's decision in the pending appeal.